

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Double-seated Valve

We, DANFOSS A/S, a Danish Company, of Nordborg, Denmark, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a method of assembling a double-seated valve, and to a double-seated valve produced according to this method. Double-seated valves, for example cut-off valves for refrigerators, have the purpose of conducting the fluid to be controlled from a common inlet via two valve seats to a common outlet. The pressure can then be relieved by means of both valve seats.

In the case of double-seated valves of this type it is difficult to make the distance between the two closure members the same as that between the valve seats. Even very small discrepancies may cause the entire closing force to act on only one of the closure members. This particular closure member may then be overloaded, whereas the other does not shut absolutely tightly.

At least one of the seats or closure members has been rendered displaceable according to known practice, for example by screwing, in order to obviate this disadvantage, but even this does not guarantee that both closure members bear on their seats with equal pressure.

The present invention has for its object to provide a double-seated valve in which both closure members bear on their respective seats with equal pressure.

According to the present invention there is provided a method for assembling a double-seated valve having its first closure member positively connected to the valve stem, which includes the steps of attaching the first seat to the body of the valve,

urging the first closure member against its seat with a predetermined force, attaching the second seat to the body of the valve, urging the second closure member against the second seat with a force equal to the aforementioned force, and positively connecting the second closure member to the valve stem or to the first closure member while this pressure is maintained. In this way it is possible to ensure that both closure members are subjected to the identical bearing pressure during operation.

In a preferred double-seated valve design for carrying this method into practical effect an extension of the stem passes through the second seat, the second closure member is then slipped on this extension and the fastening joint (for example a soldered joint) is situated on those end faces of the extension and the second closure member which are remote from the first closure member. In the case of this construction the second closure member is safely guided on the extension. The fastening joint is easily accessible to a tool, for example a soldering iron.

The above-mentioned extension may be integral with the first closure member, the latter being applied to the stem by flanging. The advantage of such an arrangement is that the first and second closure members are directly fastened to one another. In this case, tolerances are not increased by intermediate connection means.

Further according to the invention the second valve seat may have an external diameter larger than that of the first valve seat and may be fixed by flanging the wall of the insert which, consequently, is thinner than in the region of the first seat. If the insert is substantially cylindrical, the wall around the second valve seat must be thinner if the external diameter of the latter is enlarged. It may be made thin enough for

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the second valve seat to be fixed merely by flanging this wall.

In a preferred embodiment of the invention: the valve is provided with an adjustable spring which, on assembly, urges the first closure member against its seat. The order of magnitude of the force of this spring must be such as to produce sufficient closing pressure. It is this closing pressure which, during manufacture, is to be applied to both closure members. Therefore, the adjustable spring may be used to produce this bearing pressure. This means that a large part of the valve can be assembled including the adjustable spring before the second closure member is assembled, and, in this way, a pressure device for the first closure member is rendered superfluous.

The invention will now be described by way of example with reference to an embodiment thereof illustrated in the accompanying drawing. In this drawing the parts of an insertable double-seated valve which are essential to the invention are shown in longitudinal section.

Into the body 1 of an insertable valve is brazed or welded a first valve seat 2, and a second valve seat 3 with a gasket 4 is fixed by flanging the rim 5. The valve body comprises an inlet 6. The bores 7 above the valve seat 2 as well as the space below the valve seat 3 lead to a common outlet. The insertable valve body may be assembled in a valve housing which is provided with the actual connection flanges and which provides the separation between inlet and outlet spaces in the body 1.

A first closure member 9 is fixed to a valve stem 8 by means of an annular groove 10. On an extension 11 of the closure member 9 is fixed a second closure member 12 by means of a soldered joint 13. The end of the stem adjacent the first seat is provided with a plate 14 upon which an adjustable spring 15 acts whose other end is supported on an axially screwed abutment 16. The displacement of this abutment, the arrangement of the stuffing box etc. are not relevant to the invention and have therefore not been explained in further detail.

When assembling the valve, the first valve seat 2 is brazed into the body 1, the stem 8 with the closure member 9 fixed thereto is introduced from below and then the stem 8 is provided with a plate 14 and the pressure of the spring 15 is applied to it. This spring is set to a predetermined value, so that the first closure member 9 is made to bear on the first valve seat 2 with a predetermined force. Now the second valve seat 3 is positioned and fixed by flanging. Finally, the second closure member 12 is slipped on the extension 11 and is urged against the seat 3 (by means of device not illustrated

here) with the same force as the closure member 9 is urged against the seat 2. The second closure member is then fixed to the extension 11 of the first closure member 9 by welding or soldering the joint 13, while the pressure between seat 3 and closure member 12 is maintained. In this way it is ensured that both closures will engage the seats with equal pressures for all adjustments of the valve.

The embodiment illustrated here may be modified in many ways without thereby departing from the scope of the present invention. For example, an axially short closure member 9 may be fitted to the stem 8, and the stem may itself be extended towards the closure member 12. It is not necessary for the joint 13 to be provided on the end face.

WHAT WE CLAIM IS:—

1. A method for assembling a double-seated valve having its first closure member positively connected to the valve stem which includes the steps of attaching the first seat to the body of the valve, urging the first closure member against its seat with a predetermined force, attaching the second seat to the body of the valve, urging the second closure member against the second seat with a force equal to the aforementioned force, and positively connecting the second closure member to the valve stem or to the first closure member while this pressure is maintained.

2. A method as claimed in claim 1 for assembling a double-seated valve in which an extension of the valve stem passes through the second valve seat, wherein the second closure member is slipped on to the extension prior to being connected thereto by a joint situated on those end faces of the extension and the second closure member which are remote from the first closure member.

3. A method as claimed in claim 1 for assembling a double-seated valve in which an extension of the first closure member passes through the second valve seat, wherein the second closure member is slipped on to the extension prior to being connected thereto by a joint situated on those end faces of the extension and the second closure member which are remote from the first closure member.

4. A method for assembling a double-seated valve as claimed in claim 3 in which the first closure member is attached to the valve stem by flanging.

5. A method of assembling a double-seated valve as claimed in any of the preceding claims in which the second seat is of larger external diameter than the first seat and is fixed to an accordingly thinner wall portion of the valve body by flanging.

6. A method of assembling a double-

seated valve as claimed in any of the preceding claims which includes the further step of providing the valve with an adjustable spring, which on assembly, urges the first closure member against its seat.

7. A double-seated valve produced according to any of the preceding claims.

8. A method of assembling a double-seated valve substantially as hereinbefore described.

9. A double-seated valve as claimed in claim 7 substantially as hereinbefore described with reference to, and as illustrated by the accompanying drawing.

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1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale.*

